

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A conversion layer comprising chromium(III), said conversion layer being chromium(VI)-free, said conversion layer being a substantially coherent conversion layer on zinc or a zinc alloy, wherein even in the absence of silicate, cerium, aluminum and borate said conversion layer presents a corrosion protection of about 100 to 1000 h in the salt spray test according to DIN 50021 SS or ASTM B 117-73 until first attack according to DIN 50961 Chapter 10; said conversion layer being hard and resistant to wiping.

Claim 2 (previously presented): A conversion layer according to claim 1, wherein said conversion layer has across the conversion layer thickness a chromium content greater than about 1 %, in relation to zinc and chromium in the conversion layer and an average chromium content of more than about 5%; said conversion layer further having a chromium-rich zone with greater than about 20% chromium, in relation to zinc and chromium in the conversion layer, said chromium rich zone having a thickness of more than about 15 nm.

Claim 3 (previously presented): A conversion layer according to claim 1, further comprising additional components selected from the group consisting of: silicate, cerium, aluminum and borate; additional metal compounds; anions; polymers; corrosion inhibitors; silicic acids; surfactants; diols; triols; polyols; organic

acids; amines; plastics dispersions; dyes; pigments; chromogenic agents; amino acids; siccatives; dispersing agents; and mixtures thereof.

Claim 4 (previously presented): A conversion layer according to claim 1, said conversion layer being a basis for further inorganic and/or organic layers.

Claim 5 (previously presented): A conversion layer according to claim 1, further comprising a dye or color pigment for modification of the color thereof.

Claim 6 (previously presented): A conversion layer according to claim 1, having a thickness of about 100 nm.

²³
Claim 7 (previously presented): A method for producing a chromium(VI)-free conversion layer affording at least the corrosion protection of conventional chromium(VI)-containing yellow chromations, wherein a metallic surface is treated with a solution of at least one chromium(III) complex and at least one salt; said chromium(III) complex having ligand replacement kinetics more rapid than the fluoride replacement kinetics in chromium(III)-fluorocomplexes; chromium(III) being present in said solution in a concentration of 5 to 100 g/l, said method producing a chromium(VI)-free conversion layer.

²⁴
Claim 8 (previously presented): A method according to claim ²³7, wherein treatment is carried out at 20 to 100°C.

²⁵
~~Claim 9~~ (previously presented): A method according to claim ~~7~~²³, wherein ligands of the chromium(III) complex are selected from the group consisting of: chelate ligands, and complex ligands having a complexing functional group containing nitrogen, phosphorus or sulfur.

³²
~~Claim 10~~ (previously presented): A concentrate for producing a passivation solution for surfaces of zinc or zinc alloys, said concentrate substantially containing chromium(III) for a passivating component, wherein the chromium(III) is present in the form of at least one complex having ligand replacement kinetics more rapid than the fluoride replacement kinetics in chromium(III) fluorocomplexes, said concentrate being chromium(VI)-free.

³³
~~Claim 11~~ (previously presented): A concentrate according to claim ~~10~~³², wherein the chromium(III) complex is selected from complexes with chromium(III) and at least one ligand selected from the group consisting of: chelate ligands, complex ligands wherein the complexing functional group contains nitrogen, phosphorus or sulfur, phosphinates and phosphinate derivatives, and mixtures thereof, among each other as well as in mixed complexes with inorganic anions and H₂O, said chelate ligands being selected from the group consisting of dicarboxylic acids, tricarboxylic acids, hydroxycarboxylic acids, acetylacetone, urea, urea derivatives, and mixtures thereof.

³⁴
~~Claim 12~~ (previously presented): A concentrate according to claim ~~10~~³², characterised in that the concentrate is present in solid or liquid form.

~~35~~
Claim ~~13~~ (previously presented): A concentrate according to claim ~~10~~, said concentrate comprising further additives selected from the group consisting of: sealers, dewatering fluids, additional metal compounds, anions, polymers, corrosion inhibitors, silicic acids, surfactants, diols, triols, polyols, organic acids, amines, plastics dispersions, dyes, pigments, chromogenic agents, amino acids, siccatives, dispersing agents, and mixtures thereof.

~~39~~
Claim ~~14~~ (previously presented): A passivation bath for passivating a metal surface of zinc, cadmium, aluminum, or alloys thereof among each other and/or with other metals, said bath comprising chromium(III) as a passivating component, wherein chromium(III) is present in a concentration of about 5 to 100 g/l, said bath being effective, upon immersing said metal surface therein, to provide a conversion layer on said metal surface which presents a corrosion protection of about 100 to 1000 h in the salt spray test according to DIN 50021 SS or ASTM B 117-73 until first attack according to DIN 50961 Chapter 10, said passivation bath being chromium(VI)-free.

~~40~~
Claim ~~15~~ (previously presented): A passivation bath according to claim ~~14~~, wherein chromium(III) is present in a concentration of about 5 g/l to 80 g/l.

~~41~~
Claim ~~16~~ (previously presented): A passivation bath according to claim ~~14~~, wherein said bath has a pH between about 1.5 and 3.

~~42~~ ~~39~~
Claim ~~17~~ (previously presented): A passivation bath according to claim ~~14~~,
wherein said bath contains about 20 g/l chromium(III) and has a pH of about 2 to 2.5.

~~43~~ ~~39~~
Claim ~~18~~ (previously presented): A passivation bath according to claim ~~14~~,
wherein said bath contains further additives selected from the group consisting of
sealers, dewatering fluids additional metal compounds anions, polymers, corrosion
inhibitors, silicic acids, surfactants, diols, triols, polyols, organic acids, amines,
plastics dispersions, dyes, pigments, chromogenic agents, amino acids, siccatives,
dispersing agents, and mixtures thereof.

~~44~~ ~~39~~
Claim ~~19~~ (previously presented): A passivation bath according to claim ~~14~~,
said bath having a bath temperature of about 20 to 100°C.

~~51~~
Claim ~~20~~ (previously presented): A method for passivating surfaces of zinc or
zinc alloys, comprising the steps of immersing said surface, for an immersion
period, in a passivation bath comprising chromium(III) as a passivating component,
wherein chromium(III) is present in a concentration of about 5 to 100 g/l, and thereby
providing a conversion layer on said surface which presents a corrosion protection of
about 100 to 1000 h in the salt spray test according to DIN 50021 SS or ASTM B
117-73 until first attack according to DIN 50961 Chapter 10, wherein both said
passivation bath and said conversion layer provided on said surface are
chromium(VI)-free.

~~52~~ ~~51~~
Claim ~~21~~ (previously presented): A method according to claim ~~20~~, wherein

the immersion period is between about 15 and 200 seconds.

~~53~~
Claim ~~22~~ (previously presented): A method according to claim ~~20~~, said method being an elevated-temperature chromate coating method with rinsing water recycling over at least 2 cascaded rinsing stages.

~~54~~
Claim ~~23~~ (original): A method according to claim ~~22~~, characterised in that a blue chromation is performed in one of the rinsing steps.

~~57~~
Claim ~~24~~ (previously presented): A conversion layer obtained by a method comprising the steps of immersing a metal surface of zinc or zinc alloy, for an immersion period, in a passivation bath comprising chromium(III) as a passivating component, wherein chromium(III) is present in a concentration of about 5 to 100 g/l, and thereby providing said conversion layer on said metal surface, said conversion layer and said passivation bath each being chromium(VI)-free, said conversion layer presenting a corrosion protection of about 100 to 1000 h in the salt spray test according to DIN 50021 SS or ASTM B 117-73 until first attack according to DIN 50961 Chapter 10.

~~58~~
Claim ~~25~~ (previously presented): A conversion layer according to claim ~~24~~, said conversion layer providing corrosion protection of at least 100 hours in the salt spray test according to DIN 50021 SS until first attack according to DIN 50961 Chapter 10.

~~59~~
Claim 26 (previously presented): A conversion layer according to claim 24,
said layer presenting a greenish, red-green iridescent color for zinc.

~~60~~
Claim 27 (previously presented): A conversion layer according to claim 24,
said layer having a layer thickness of about 100 nm.

~~62~~
Claim 28 (previously presented): A conversion layer obtained by a method
comprising treating a metallic surface of zinc or zinc alloys with a solution of at least
one chromium(III) complex and at least one salt, said chromium(III) complex having
ligand replacement kinetics more rapid than the fluoride replacement kinetics in
chromium(III)-fluorocomplexes, said solution being chromium(VI)-free.

~~63~~
Claim 29 (previously presented): A conversion layer comprising
chromium(III), said conversion layer being chromium(VI)-free, said conversion layer
being a substantially coherent conversion layer on zinc or a zinc alloy, said
conversion layer presenting a corrosion protection of about 100 to 1000 h in the salt
spray test according to DIN 50021 SS or ASTM B 117-73 until first attack according
to DIN 50961 Chapter 10, said conversion layer having an average chromium
content of more than approximately 5% based on zinc and chromium, said
conversion layer having a chromium index greater than approximately 10, wherein
the chromium index is defined as said average chromium content
(chromium/(chromium + zinc)) in the layer greater than 1% Cr, multiplied by the layer
thickness in nm.

~~7~~
Claim ~~30~~ (previously presented): A conversion layer according to claim 1, said layer being free from the presence of silicate, cerium, aluminum, and borate.

~~8~~
Claim ~~31~~ (previously presented): A conversion layer according to claim 1, said layer having a layer thickness of about 100 nm to 1000 nm, said conversion layer having across the conversion layer thickness a chromium content of greater than 1% based upon zinc and chromium.

~~9~~
Claim ~~32~~ (previously presented): A conversion layer according to claim 1, said layer being clear or substantially colorless.

~~10~~
Claim ~~33~~ (previously presented): A conversion layer according to claim 1, said layer further comprising cobalt.

~~11~~
Claim ~~34~~ (previously presented): A conversion layer according to claim 1, said layer further comprising one or more metal compounds selected from the group consisting of 1- to 6-valent metal compounds.

~~12~~
Claim ~~35~~ (previously presented): A conversion layer according to claim 1, said layer further comprising one or more anions.

~~64~~
Claim ~~36~~ (previously presented): A conversion layer according to claim ~~29~~ ~~63~~, said layer further comprising one or more materials selected from the group consisting of polymers, corrosion inhibitors, silicic acids, surfactants, polyols, organic acids, amines, plastics, dispersions, dyes, pigments, chromogenic agents, amino

acids, siccatives, dispersing agents, organic polymers, diols, triols, monocarboxylic acids, carbon black, metal chromogenic agents, glycin, and cobalt siccatives.

13

Claim ~~37~~ (previously presented): A conversion layer according to claim 1, having a chromium index greater than 10, the chromium index being defined as the average chromium content in said conversion layer greater than 1% chromium, multiplied by the thickness of said conversion layer.

14

Claim ~~38~~ (previously presented): A conversion layer according to claim 3, wherein said anions include an anion selected from the group consisting of halide ions, sulfurous ions, nitrate ions, phosphoric ions, diphosphate ions, linear and/or cyclic oligophosphate ions, linear and/or cyclic polyphosphate ions, hydrogen phosphate ions, carboxylic acid anions, and silicon-containing anions.

15

Claim ~~39~~ (currently amended): A conversion layer according to claim 3, wherein said additional metal compounds include at least one 1- to 6-valent metal compound selected from the group consisting of compounds of Na, Ag, Al, Co, Ni, Fe, Ga, In, lanthanides, Zr[(:)], Sc, Ti, V, Cr, Mn, Cu, Zn, Y, Nb, Mo, Hf, Ta, W.

26

Claim ~~40~~ (previously presented): A method according to claim ~~7~~, said metal surface being zinc or a zinc alloy.

23

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Claim ~~41~~ (previously presented): A method according to claim ~~9~~, said chelate

25

ligands being selected from the group consisting of dicarboxylic acids, tricarboxylic acids, hydroxycarboxylic acids, maleic acid, phthalic acid, terephthalic acid, tartaric acid, citric acid, malic acid, ascorbic acid, acetylacetone, urea, urea derivatives, and mixtures thereof.

~~28~~
Claim ~~42~~ (previously presented): A method according to claim ~~9~~ ²⁵, said complex ligands being selected from the group consisting of -NR₂, -PR₂, and -SR compounds, wherein R is H or an organic radical, phosphinates, phosphinate derivatives, and mixtures thereof.

~~45~~
Claim ~~43~~ (previously presented): A passivation bath according to claim ~~15~~ ⁴⁰, wherein said chromium (III) is present in a concentration of about 10 g/l to 30 g/l.

~~46~~
Claim ~~44~~ (currently amended): A passivation bath according to claim ~~18~~ ⁴³, wherein said additional metal compounds are selected from the group consisting of

- 1- to 6-valent metal compounds of Na, Ag, Al, Co, Ni, Fe, Ga, In, lanthanides, Zr, Sc, Ti, V, Cr, Mn, Cu, Zn, Y, Nb, Mo, Hf, Ta, and W;
- said anions being selected from the group consisting of halide ions, sulfurous ions, nitrate ions, phosphoric ions, diphosphate ions, linear and cyclic oligophosphate ions, linear and cyclic polyphosphate ions, hydrogen phosphate ions, carboxylic acid anions, and silicon-containing anions;
- said silicic acids being colloidal or disperse silicic acids;
- said chromogenic agents including metallic chromogenic agents.

~~47~~
Claim ~~45~~ (previously presented): A passivation bath according to claim ~~18~~,
said amino acids including glycine.

~~55~~
Claim ~~46~~ (previously presented): A method according to claim ~~21~~, said
immersion period being between about 15 and 100 seconds.

Claim 47 (canceled).

~~16~~
Claim ~~48~~ (previously presented): A conversion layer according to claim 1,
said conversion layer being transparent.

~~17~~
Claim ~~49~~ (previously presented): A conversion layer according to claim 1,
said conversion layer being iridescent.

~~18~~
Claim ~~50~~ (previously presented): A conversion layer according to claim 1,
said conversion layer having a chromium-rich zone comprising greater than about
20% chromium based on zinc and chromium in said chromium-rich zone.

~~19~~
Claim ~~51~~ (previously presented): A conversion layer according to claim ~~50~~,
said chromium-rich zone having a thickness of at least 15 nm.

~~29~~
Claim ~~52~~ (previously presented): A method according to claim ~~8~~, wherein said
treatment is carried out at 30-60°C.

~~30~~ ~~25~~
Claim ~~53~~ (previously presented): A method according to claim ~~9~~, wherein said chelate ligands are selected from the group consisting of dicarboxylic acids, tricarboxylic acids and hydroxycarboxylic acids.

~~31~~ ~~25~~
Claim ~~54~~ (previously presented): A method according to claim ~~9~~, wherein said chelate ligands are selected from the group consisting of oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, maleic acid, phthalic acid, terephthalic acid, tartaric acid, citric acid, malic acid, and ascorbic acid.

~~48~~ ~~43~~
Claim ~~55~~ (currently amended): A passivation bath according to claim ~~18~~, said additional metal compounds being selected from the group consisting of 1- to 6-valent metal compounds of Na, Ag, Al, Co, Ni, Fe, Ga, In, lanthanides, Zr[(:)], Sc, Ti, V, Cr, Mn, Cu, Zn, Y, Nb, Mo, Hf, Ta, and W.

~~49~~ ~~43~~
Claim ~~56~~ (previously presented): A passivation bath according to claim ~~18~~, said anions being selected from the group consisting of halide ions, sulfurous ions, nitrate ions, phosphoric ions, carboxylic acid anions; and silicon-containing anions.

~~20~~
Claim ~~57~~ (previously presented): A conversion layer according to claim 1, said conversion layer being clear, transparent and essentially colorless, said conversion layer presenting a multi-colored iridescence.

~~21~~
Claim ~~58~~ (previously presented): A conversion layer according to claim 1,

said conversion layer having a thickness of about 100 nm to 1000 nm.

~~36~~
Claim ~~59~~ (previously presented): A concentrate according to claim ~~11~~, said
complexing functional group of said complex ligands being -NR₂, -R₂, or -SR,
wherein R independently is an aliphatic radical or H.

~~37~~
Claim ~~60~~ (currently amended): A concentrate according to claim ~~13~~, said
metal compounds being selected from the group consisting of 1-to 6-valent metal
compounds of Na, Ag, Al, Co, Ni, Fe, Ga, In, lanthanides, Zr[\cdot], Sc, Ti, V, Cr, Mn,
Cu, Zn, Y, Nb, Mo, Hf, Ta, and W; said anions being selected from the group
consisting of halide ions, sulfurous ions, nitrate ions, phosphoric ions, carboxylic acid
anions, and silicon-containing anions; said polymers being selected from the group
consisting of organic polymers.

~~38~~
Claim ~~61~~ (previously presented): A concentrate according to claim ~~13~~, said
silicic acids being colloidal or disperse silicic acids, said organic acids being
monocarboxylic acids, said chromogenic agents being metallic chromogenic agents,
said amino acid being glycine, said siccatives being cobalt siccatives.

~~39~~
Claim ~~62~~ (previously presented): A conversion layer according to claim 1,
said chromium(III) being provided via a chromium(III) complex having ligand
replacement kinetics more rapid than the fluoride replacement kinetics in
chromium(III)-fluorocomplexes.

~~50~~
Claim ~~63~~ (previously presented): A passivation bath according to claim ~~14~~.

said chromium(III) being present in said passivation bath at least in part as a chromium(III) complex having ligand replacement kinetics more rapid than the fluoride replacement kinetics in chromium(III)-fluorocomplexes.

~~56~~ Claim ~~64~~ (previously presented): A method according to claim ~~20~~ ⁵¹, said chromium(III) being present in said passivation bath at least in part as a chromium(III) complex having ligand replacement kinetics more rapid than the fluoride replacement kinetics in chromium(III)-fluorocomplexes.

~~61~~ Claim ~~65~~ (previously presented): A conversion layer according to claim ~~24~~ ⁵⁷, said chromium(III) being present in said passivation bath at least in part as a chromium(III) complex having ligand replacement kinetics more rapid than the fluoride replacement kinetics in chromium(III)-fluorocomplexes.

~~65~~ Claim ~~66~~ (new): A conversion layer comprising chromium(III), said conversion layer being chromium(VI)-free, said conversion layer being a substantially coherent conversion layer on zinc or a zinc alloy, said conversion layer having a thickness of about 100-1000 nm, said conversion layer presenting a corrosion protection of about 100 to 1000 h in the salt spray test according to DIN 50021 SS or ASTM B 117-73 until first attack according to DIN 50961 Chapter 10.

~~66~~ Claim ~~67~~ (new): A conversion layer according to claim ~~66~~ ⁶⁵ wherein said conversion layer has across the conversion layer thickness a chromium content greater than about 1 %, in relation to zinc and chromium in the conversion layer and

an average chromium content of more than about 5%.

~~67~~
Claim ~~68~~ (new): A conversion layer according to claim ~~66~~, having a thickness of about 100 nm.

~~68~~
Claim ~~69~~ (new): A conversion layer according to claim ~~66~~, further comprising a dye or color pigment for modification of the color thereof.

~~69~~
Claim ~~70~~ (new): A conversion layer according to claim ~~66~~, said layer being free from the presence of silicate, cerium, aluminum, and borate.

~~70~~
Claim ~~71~~ (new): A conversion layer according to claim ~~66~~, said layer being clear or substantially colorless.

~~71~~
Claim ~~72~~ (new): A conversion layer according to claim ~~66~~, said layer further comprising cobalt.

~~72~~
Claim ~~73~~ (new): A conversion layer according to claim ~~66~~, said layer further comprising one or more metal compounds selected from the group consisting of 1- to 6-valent metal compounds.

~~73~~
Claim ~~74~~ (new): A conversion layer according to claim ~~66~~, said layer further comprising one or more anions.

~~74~~
Claim ~~75~~ (new): A conversion layer according to claim ~~66~~, having a chromium index greater than 10, the chromium index being defined as the average chromium content ($\text{chromium}/(\text{chromium} + \text{zinc})$) in said conversion layer greater than 1% chromium, multiplied by the thickness in nm of said conversion layer.

~~75~~
Claim ~~76~~ (new): A conversion layer according to claim ~~66~~, said conversion layer being transparent.

~~76~~
Claim ~~77~~ (new): A conversion layer according to claim ~~66~~, said conversion layer being iridescent.

~~77~~
Claim ~~78~~ (new): A conversion layer according to claim ~~66~~, said chromium(III) being provided via a chromium(III) complex having ligand replacement kinetics more rapid than the fluoride replacement kinetics in chromium(III)-fluorocomplexes.

~~78~~
Claim ~~79~~ (new): A conversion layer according to claim ~~66~~, said conversion layer having a chromium-rich zone with greater than about 20% chromium, in relation to zinc and chromium in the conversion layer.